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Form Approved
OMB No. 0704-0188

erage 1 hour per response, including the time for review instructions, searching existing data sources, the collection of information. Send comments regarding this burden estimate or any other aspect of this Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
		FINAL 1 May 89 - 31 Oct 91

4. TITLE AND SUBTITLE
"ALGORITHMS TO SOLVE NONLINEAR TIME DEPENDENT PROBLEMS OF ENGINEERING AND PHYSICS" (U)

5. FUNDING NUMBERS
62301E
6776/00/DARPA

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AFOSR-TR-

8. PERFORMING ORGANIZATION REPORT NUMBER
92 0425

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
AFOSR/NM
Bldg 410
Bolling AFB DC 20332-6448

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
AFOSR-89-0341

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release;
Distribution unlimited

12b DISTRIBUTION CODE
UL

DTIC
ELECTE
MAY 26 1992
S A D

13. ABSTRACT *(Maximum 200 words)*

92-13738

A triangle based nonoscillatory shock capturing algorithm was developed and applied successfully to immiscible oil recovery problems. Chevron researchers are now using this successfully for real problems.

92 5 22 071

14. SUBJECT TERMS	15. NUMBER OF PAGES 1
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	SAR

AFOSR R&D Final Report
Grant #AFOSR-89-0341

A triangle based nonoscillatory shock capturing algorithm was developed and applied successfully to immiscible oil recovery problems. Chevron researchers are now using this successfully for real problems.

Grid orientation effects in immiscible flows were reduced dramatically via 3rd order accurate ENO schemes. Again, Chevron researchers are using this method in their codes.

High-order ENO schemes were applied to three dimensional compressible gas flow problems. Shock-turbulence interactions were successfully computed. Standard methods, e.g. spectral techniques, fail in the presence of discontinuities.

A new simple method for computing detonation waves accurately was developed. This enables one to compute complicated chemical reactions in multiple species. The method used successfully for ZND detonation waves.

Shocks were discovered numerically for the hydrodynamic submicron semi-conductor device model.

Nonlinear ENO filters were developed and used successfully, simplifying high order accurate shock calculations.

Multiresolution analysis was proposed as a device for grid generation in high Reynolds number flows. Preliminary results look very promising.

Travelling waves were found for a singular diffusion equation arising in self-organized criticality. These waves were proven to be stable, validating the physical and numerical evidence.

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